Space Weather Forecast

Issued on Monday, 01 November 2021 at 12:35 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further moderate-class flares. Slight chance of G1/Minor geomagnetic storm interval 3rd and 4th.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: There are currently 3 active sunspot regions on the visible disc and solar activity has been Moderate over the past 24 hours, with a few Common-class flares and a Moderate flare observed at 01/0145 UTC. This emanated from a sunspot region in the southwest quadrant and produced a Coronal Mass Ejection (CME) which is likely to have an Earth directed component but we are awaiting further imagery and analysis at the time of writing. Currently the most complex region is one approaching the meridian. This region produced a flare just after 31/0700 UTC which generated a CME, analysis of which suggests a possible glancing blow at Earth late on the 3rd or early the 4th November.

Solar Wind / Geomagnetic Activity: Solar wind parameters, were indicative of the waning effects of a CME that arrived just after 31/0900 UTC. Elevated wind speeds, around 450 km/s, have gradually declined to ambient levels, around 350 km/s. The total magnetic field was initially moderate but reduced to weak levels from 31/1400 UTC, with its north-south component predominantly negative, but weak. Resultant geomagnetic activity was mainly Quiet to Unsettled (Kp 1-3) but with Active (Kp 4) intervals recorded 31/1200-1500 UTC and 31/2100-2400 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained slightly elevated but below minor storm levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is forecast to be low over the next 4 days with a chance of further moderate-class flares.

Solar Wind / Geomagnetic Activity: Slow solar winds are expected to continue through days 1 and 2 (1st and 2nd) with predominantly Quiet geomagnetic activity. On days 3 and 4 (3rd and 4th), the solar wind is likely to become elevated due to coronal hole influences, possibly combined with weak CME effects. Unsettled to Active intervals are likely on days 3 and 4, and there is a slight chance of G1/Minor Geomagnetic Storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be below storm level with a general decrease towards background levels.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	20	20
Very Active	R3 to R5 X	No	5	5	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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